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# PATENT SPECIFICATION

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 (72) Inventors CHRISTOPHER JOHN DIGNET CATTO and  
 NIGEL VICTOR CHARMAN



## (54) CHECK-OUT TERMINAL

(71) We, THE PLESSEY COMPANY LIMITED, a British Company of 2/60 Vicarage Lane, Ilford, Essex, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a checkout terminal having a particular but not necessarily an exclusive application at supermarket checkout points.

The automatic scanning of labels, particularly at supermarket checkout points, requires a scanning head allied to some kind of feed or conveyor system which is arranged such that coded labels or markings can be read reliably by the checkout system and such that the checkout system operator can intervene in the event of faulty labels or markings or if an article gets jammed in the system, and ensure that customers do not by-pass the scanner. In known systems, the checkout system operator has to physically drag the articles being checked over a transparent scanning slit. This known arrangement does not give an appreciable saving in labour and introduces the chance of errors caused by variable dragging speeds and dirt or scratch-marks on the transparent scanning slit.

The invention provides a checkout terminal wherein coded data identifying articles being checked out are carried past an optical code reading system at a substantially constant distance away including a main conveyor belt tilted in a transverse direction to its longitudinal axis and at least two subsidiary conveyor belts arranged along a longitudinal side edge of the main conveyor belt in a manner such that the major surface of each of the subsidiary belts is substantially at right angles to the major surface of the main belt, the subsidiary belts being arranged so that when relative movement is produced between the articles carried by the conveyor belts and the optical code reading system, the coded data identifying the articles is exposed to the optical code reading system.

The foregoing and other features according

to the invention will be better understood from the following description with reference to the accompanying drawing in which:—

Figure 1 diagrammatically illustrates, in an end elevation, a conveyor system for a checkout terminal according to the invention,

Figures 2 to 5 diagrammatically illustrate, in perspective views, alternative arrangements for the conveyor system of Figure 1, and

Figure 6 diagrammatically illustrates, in a perspective view, a checkout terminal which can include any one of the conveyor systems of Figures 1 to 5.

In a checkout terminal according to the present invention, the conveyor system utilises, as is diagrammatically illustrated in Figure 1 of the drawings, a main conveyor belt 20, tilted at a controlled angle B, and at least two subsidiary belts, such as the belt 21, arranged in line, and at 90° to the main belt 20. The belts 20 and 21 are arranged in such a way that whether the package, bottle, jar, box etc. is a "tall" article, such as the package 22, or a "squat" article such as the package 23, it can be supported in a stable position by the belts 20 and 21, as illustrated in Figure 1. The articles 22 and 23 have coded labels or markings on the side touching the subsidiary belts 21 and for a scanning system that requires a single scanning slit, there are, as illustrated in Figure 2 of the drawings, two subsidiary belts 21, arranged one after the other with a small gap 24 therebetween. The belts are each driven in the direction of the arrows 'A' and are guided by rollers 25 or the like. The single scanning slit 26 is located in the gap 24 and is situated just below the upper surface of the belts 21, the light reflected or transmitted by the coded labels or markings being detected by an optical code reader as the articles pass the gap between the belts 21.

An optical code system that can be read regardless of its orientation by a single slit scanner system is given in our co-pending Patent Application Number 50917/72 Serial No. 1445097 and this optical code system is ideally suited for the conveyor system of Figures 1 to 2. However, cartons, such as

- carried past an optical code reading system at a substantially constant distance away including a main conveyor belt tilted in a transverse direction relative to its longitudinal axis and at least two subsidiary conveyor belts arranged along a longitudinal side edge of the main conveyor belt in a manner such that the major surface of each of the subsidiary belts is substantially at right angles to the major surface of the main belt, the subsidiary belts being arranged so that when relative movement is produced between the articles carried by the conveyor belts and the optical code reading system, the coded data identifying the article is exposed to the optical code reading system.
2. A checkout terminal as claimed in claim 1 wherein two subsidiary conveyor belts are provided spaced-apart along the longitudinal side edge of the main conveyor belt and wherein the optical code reading system has a single scanning slit which is located in the space between the subsidiary belts.
3. A checkout terminal as claimed in claim 1 wherein two subsidiary conveyor belts are provided spaced-apart along the longitudinal side edge of the main conveyor belt, wherein the optical code reading system has a multi-slit scanning system which is located in the space between the subsidiary belts and wherein the terminal includes a series of rollers, or wheels situated in the gaps between the scanning slits of the optical code reading system.
4. A checkout terminal as claimed in claim 3 wherein a further narrower subsidiary belt is provided and situated in the space between the other subsidiary belts in a position immediately adjacent to the longitudinal side edge of the main conveyor belt.
5. A checkout terminal as claimed in claim 1 wherein three subsidiary conveyor belts are provided, the middle one of which is of a light transparent material and wherein the optical code reading system is situated behind the conveying surface of the transparent subsidiary belt.
6. A checkout terminal as claimed in claim 5 wherein the transparent subsidiary belt is narrower than the other two subsidiary belts and is spaced-apart from the longitudinal side edge of the main conveyor belt and wherein a further subsidiary belt is provided and situated in the space between the main and the transparent conveyor belts.
7. A checkout terminal as claimed in any one of the preceding claims wherein the main conveyor belt is provided with a ribbed conveying surface.
8. A checkout terminal as claimed in claim 7 wherein the ribs are lateral ribs.
9. A checkout terminal as claimed in any one of the preceding claims wherein the conveying surface of the main conveyor belt is divided into sections by means of vertical fins in order to effect a reduction in the ambient lighting at the scanning area.
10. A checkout terminal as claimed in any one of the preceding claims which includes means for vibrating the main conveyor belt at that end thereof whereat the articles to be checked out are placed on the main conveyor belt.
11. A checkout terminal as claimed in any one of the preceding claims which includes a cover for the scanning area of the main and the subsidiary conveyor belts.
12. A checkout terminal as claimed in any one of the preceding claims which further includes a manual optical scanning head.
13. A checkout terminal substantially as hereinbefore described with reference to Figures 1 to 6 of the accompanying drawings.

R. NICHOLSON,  
Patent Agent,  
For the Applicant.

2 SHEETS

Sheet 2

Fig. 1 is a perspective view of a mechanical assembly 10. The assembly includes a base 36 with a front face 41. A component 20 is mounted on the base, and a spring 37 is attached to it. A component 35 is also visible. A section line A-A is indicated. Other components are labeled 21, 25, 33, 34, 38, 39, and 40.